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Evaluation of Texas Air Control Board Management and Operations Systems Requirements Part I: Identification of TACB Data Needs

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Prepared for

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The purpose of this report is to provide information for the design of management and operations systems to effectively implement and control the collection, storage, verification, and dissemination of emissions inventory information within the Texas Air Control Board (TACB). Part I identifies all essential emissions inventory information to meet TACB operational requirements, develops the priority order in collecting, verifying, and storing the inventory information, and establishes the formats for data use.

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EVALUATION OF TEXAS AIR CONTROL BOARD MANAGEMENT AND OPERATIONS SYSTEMS REQUIREMENTS

PART I
IDENTIFICATION OF TACB DATA NEEDS

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This report has been reviewed by Ruth Tatom, Environmental Protection Agency, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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LIST OF ACRONYMS AND TERMS

AEROS - Aerometric and Emission Reporting Systems
AQCR - Air Quality Control Region
BACT - Best Available Control Technology
CAA - Clean Air Act (federal)
CDS - Compliance Data System
CTG - Control Techniques Guidelines
EI - Emissions Inventory
EIS - Emissions Inventory Section
EPA - Environmental Protection Agency
HATREMS - Hazardous and Trace Substance Emission System
LAER - Lowest Achievable Emission Rate
NAA - Nonattainment Area
NAAQS - National Ambient Air Quality Standards
NADB - National Air Data Branch
NEDS - National Emission Data System
NESHAPS - National Emission Standards For Hazardous Air Pollutants
NSPS - New Source Performance Standards
NSR - New Source Review
OAQPS - Office Of Air Quality Planning and Standards
PSD - Prevention Of Significant Deterioration
PSED - Permits and Source Evaluation Division
RACT - Reasonably Available Control Technology
RFP - Reasonable Further Progress
SCC - Source Classification Code
SIC - Standard Industrial Classification Code
SIP - State Implementation Plan
SIS - Source Information System
SMSA - Standard Metropolitan Statistical Area
TACB - Texas Air Control Board
TSP - Total Suspended Particles
UTM- Universal Transverse Mercator
VOC - Volatile Organic Compounds

SECTION 1

INTRODUCTION

This report summarizes the efforts of PEDCo Environmental, Inc. and of Arthur Young and Company in the performance of Phase I of U.S. Environmental Protection Agency (EPA), Contract No. 68-02-2535, Task 17, entitled, "Evaluation of Texas Air Control Board Management and Operations Systems Requirements." The general purpose of this report is to provide information for the design of management and operations systems to effectively implement and control the collection, storage, verification, and dissemination of emissions inventory information within the Texas Air Control Board (TACB). The specific objectives of this report are to identify essential elements of emissions information needed by TACB to meet its assigned responsibility, to establish a priority order for the collection and development of such information, and to prescribe formats for collecting and disseminating the information.

This task is being conducted in three phases; this report covers only the first phase. Phase I is intended to identify all essential emissions inventory information to meet TACB operational requirements, to develop a priority order to collect, verify, and store such information, and to establish suitable formats for data use. Most of the information in this phase of the task was developed by the staff of PEDCo Environmental, Inc., with significant support from Arthur Young and Company. In Phase II of the task Arthur Young and Company will assume three principal responsiblities: (1) develop an emissions inventory data management system overview, (2) develop data dictionaries for existing TACB systems, and (3) determine data requirements

and data collection methods in support of existing TACB operations and in support of future EPA mandates. At a later date this material will be appended to this Phase I report, and will be used to develop preliminary recommendations regarding data collection methodologies for information that TACB requires but does not currently obtain. Phase III of the task is the development of the emissions inventory data management system and the implementation of a plan to maintain suitable emissions inventory data. This work will be conducted by TACB or by a designated contractor at the conclusion of Phase II.

TACB has made several attempts in the past to assemble a comprehensive emissions inventory. However, manpower limitations, increasing requirements from the enactment of the federal Clean Air Act amended in 1977 (CAA 77), and organizational problems have prevented the Emissions Inventory Section from being able to keep their records up-to-date and in an easily accessible format. As a result TACB was ill-equipped to prepare a comprehensive emissions inventory for the 1979 State Implementation Plan revision. The emissions inventory data that were used are a mixture of the 1975 inventory and subsequent permit and compliance update data. Also, in the past few years, various TACB groups, being unable to rely on the Emissions Inventory Section for up-to-date data, have developed their own data sources.

Our understanding of TACB's operational structure is based on published information and on interviews which we conducted at TACB. An important aspect of our work was to identify TACB operational functions, which are mandated by federal regulation, and to differentiate those federal mandated duties from routine operational duties which the TACB would probably carry out if there had not been widespread federal intervention into state programs. However, the TACB has incorporated required federal policies into their regulations to such an extent that it is difficult to make a clear distinction between regulations serving only Texas needs and those also meeting Federal requirements.

Nevertheless, TACB's operational and reporting requirements have been significantly increased as a result of federal directives.

Interviews were conducted at TACB with personnel of the Emissions Inventory, Permits, Compliance, and Control Strategy Sections in order to gain appreciation for their operational responsibilities and to determine emissions inventory data requirements within each of those groups. The results of those interviews are discussed in Sections 2 (Emissions Inventory), 3 (Permits), 4 (Compliance), and 5 (Control Strategy) of this report.

We have outlined various federal mandates that EPA has imposed on the TACB. Our understanding of TACB operating requirements in support of these federal policies is based primarily on document reviews. We expected to conduct interviews with EPA personnel to elucidate existing federal requirements and to identify additional programs that EPA expects to implement in the future, but certain delays in the definition of this task precluded conducting such interviews in time to include the results in this Phase I report.

Texas House Bill 793 requires that "before a regulatory agency inspects, surveys, investigates, or requires a report to be filed by a regulated individual or business, the executive head of the agency shall determine if that agency's or another regulatory agency's previous inspection, survey, investigation, or reporting requirement has gathered information about the individual or business that substantially satisfies the present information need of the agency. If so, the regulatory agency may not inspect, survey, investigate, or require a report to be filed by the individual or business." Thus TACB must insure that it is not duplicating its own efforts or efforts of other regulatory agencies. A recent TACB analysis has indicated that no significant duplication of effort is being made by TACB, but that a massive emissions inventory effort might result in collection of some data that are already in TACB files. In order to determine whether these and other pertinent emissions inventory data may

also be available through other state agencies, TACB has queried those other agencies by letter. The results of that survey are not yet available and will be presented as part of Phase II of this task.

The principal objectives of this report are to identify data resources currently available to the TACB which could be used in constructing an emissions inventory and to determine the operational data items for various TACB and external users which the Emissions Inventory Section should be expected to supply. Two types of data are examined:

- Data to support day-to-day operational requirements of the TACB.
- Data to fulfill requirements mandated by extra-TACB groups such as EPA.

The following sections of this report address the functions and data requirements of various groups within TACB. Section 2 reviews the current status of data now filed in the Emissions Inventory Section of the TACB and describes current and anticipated EPA reporting requirements which are or may become responsibilities of the Emissions Inventory Section. Section 3 identifies requirements of the Permits and Source Evaluation Division. Section 4 describes Compliance Division data needs. Section 5 outlines Control Strategy Division requirements. Section 6 discusses priorities for the collection of data, giving consideration to existing constraints on the TACB. Section 7 concludes with a description of our understanding of TACB data dissemination requirements.

This document is a summary presentation of our current understanding of TACB operational requirements and EPA requirements which will determine the structure and scope of an emissions inventory management system. As such this document should be extensively reviewed by EPA and TACB operational groups so that constructive comment can be fed back to the contractor, to EPA, and to TACB to aid in the successful accomplishment of Phase II and Phase III activities which are to follow.

SECTION 2

EMISSIONS INVENTORY SECTION DATA AND REQUIREMENTS

PURPOSE OF EMISSIONS INVENTORY SECTION

The TACB Emissions Inventory Section (EIS) is responsible for providing timely source and emissions information for both point and area emissions sources sufficient to enable TACB to:

- Conduct effective field investigations.
- Enforce emissions limitations regulations.
- Develop control strategies.
- Meet any routine or special reporting requirements mandated by state and federal law.
- Estimate feasibility of new and alternative control requirements.

The Emissions Inventory Section includes an Information Group and a Coordination Group. The Information Group is responsible for:

- Handling routine industry, government, and citizen requests for inventory information.
- Meeting National Emissions Data System (NEDS) reporting requirements.
- Maintaining area and point source files.
- Section coordination with Permits and Compliance.
- Meeting reasonable further progress (RFP) and nonattainment areas (NAA) inventory reporting requirements.
- Monitoring and initiating procedures needed to meet Emissions Inventory (EI) requirements resulting from the "banking" provisions of Regulation VI.

- Source Information System (SIS) forms review.
- Identification of new sources to be inventoried.
- Questionnaire development.

The Coordination Group is responsible for:

- Interface and coordination on modeling projects.
- Data acquisition and storage.
- Coordinating and maintaining a working relationship with Metropolitan Planning Organizations.
- Meeting any EI requirements for inspection and maintenance programs.
- Liaison with the Texas Natural Resources Information System.
- Section coordination with Data Processing, Control Strategy, and Health Effects.
- Liaison with trade and professional organizations.
- Meeting Hazardous and Trace Emissions System (HATREMS) reporting requirements.
- Emissions trends reports.

The TACB has acknowledged a general need to expand its emissions inventory activities considerably. In response to a CAA 77 mandate for a comprehensive and accurate current emissions inventory, TACB has proposed in the 1979 SIP revisions to continuously update an emissions inventory, using source surveillance and permit data as well as updated area source input data.

OVERVIEW OF OPERATIONAL STRUCTURE

The Emissions Inventory Section has minimal technical need for the data which are accumulated or which should be accumulated by TACB. This section has specific reporting requirements to EPA which will be discussed, but the principal function of this TACB Section is to provide and maintain data for use by other TACB sections, by EPA, and by industry. The Emissions Inventory

Section should function as a library, serving as an active data repository. The main problem is that the section does not now maintain up-to-date, easily accessible records; the result is that other TACB sections which rely upon emissions data have had to develop their own data sets.

EXISTING INVENTORIES AND COLLECTION METHODOLOGY

The first TACB emissions inventory was for calendar year 1968. Additional inventories were made in 1969, 1970, 1971-1972, 1973, and 1975. The 1973 inventory is the only one that is currently computerized. Participants in the 1973 inventory included sources who had listed 1972 emissions exceeding 100 ton/yr of any criteria pollutant, new sources since 1972, and certain specific sources which were subject to regional office reporting requests. Data were reported by pollutant and by point source. Altogether 5086 questionnaires were submitted, but data for only 2310 of the larger sources were computerized by TACB. The only computer output data that can be obtained from this inventory are facility identification parameters and total annual emissions (ton/yr) of particulates, SO_2, HC, CO, and NO_x for each facility. TACB reported that 650 facilities accounted for 95 percent of all point source emissions in 1973.

TACB developed a more comprehensive questionnaire for 1975 emissions and requested data from 880 facilities, but the data for this inventory were never fully computerized by TACB. Nevertheless, this inventory is considered to be the most comprehensive data base in the TACB system. Figure 1 is a list of data requested for that inventory. The data base has been partially updated with field inspection data and new source permit data.

TACB developed an automated area source emissions inventory for the year 1973 to supplement the 1973 point source emissions inventory. Emissions data for particulate, SO_2, NO_x, hydrocarbons and carbon monoxide were estimated from such area sources as agricultural tilling, unpaved roads, vehicle transportation, open burning and incineration, and commercial and residential heating.

FIGURE 1. DATA POINTS REQUESTED FOR 1975 EMISSIONS INVENTORY

1. Company name and address.
2. Location: City and county.
3. Plant name and address (if different from above).
4. Plant location: City and county.
5. Air Quality Control Region number.
6. Primary business at this location.
7. Standard Industrial Classification Code.

Process Data

8. Process name.
9. Raw materials used, tons per year each.
10. Products manufactured, tons per year each.
11. Air pollutants emitted from process, tons per year each.
12. Type of air pollution abatement equipment.
13. Company assigned control equipment number.
14. Company assigned emission point number.
15. Design and operating efficiency of the air pollution control equipment, percent.
16. Quantity of air pollutants emitted to atmosphere, tons per year each.

    (Air pollutants in this document, including but not limited to, nitrogen oxides, sulfur dioxide, volatile organic compounds, carbon monoxide, particulate matter, hydrogen sulfide, sulfuric acid, fluorides, ammonia, chlorine, hydrogen chloride).

Exhaust Stack or Vent Data

17. Emission point number for each point.
18. Type of emission point, stack or other type.

FIGURE 1. (continued)

19. Stack height and diameter.

20. Exhaust gas flow rate (volume) and exit temperature.

21. Location: latitude and longitude.

Heater and Boiler Data

22. Type of heater and design capacity of each in million Btu per hour.

23. Type fuel used and quantity of each, units/year.

24. Heat content of fuel in Btu/unit.

25. Type and efficiency (%) of air pollution control equipment.

Painting, Printing, and Degreasing

26. Type of paint, ink, or solvent used.

27. Quantity of each used per year and percent solvent of each.

28. Type and efficiency (%) of air pollution control equipment used.

29. Quantity of air pollutants emitted to atmosphere, tons per year each.

Storage Tank And Loading/Unloading Data

30. Name of material stored and tank capacity for each tank (thousands gallons).

31. Vapor pressure of material at a specified temperature.

32. Type and efficiency (%) of vapor control equipment.

33. Company assigned emission number and quantity of vapor emitted, tons per year.

34. Type of material loaded or unloaded.

35. Monthly throughput (thousands gallons) and vapor control system.

36. Vapor loss of each material transferred, tons per year.

37. Method of loss calculation.

FIGURE 1. (continued)

Waste Disposal

38. Waste disposal method.

39. Type of burning device, if used.

40. Quantity burned, pounds per hour, pounds per day, tons per year.

41. Burn schedule, hours per day, days per year.

42. Type and quantity of auxiliary fuel used.

43. Type and efficiency of air pollution control equipment used.

Hazardous Materials and Volatile Organic Solvents

44. Quantity of hazardous materials and volatile organic solvents not included above, tons per year each.

45. Emission point associated with these emissions.

These data were collected partly from other Texas agencies such as the Highway, Agriculture, and Public Safety Departments, the Railroad Commission, and the Department of Water Resources.

APPROPRIATE DATA FOR AN EMISSIONS INVENTORY

The essential task of the Emissions Inventory Section is to provide a working data repository for all groups within TACB. However, this does not mean that all of the data used by TACB should be incorporated into the emissions inventory. Considerable data may be used by only one group. Such data would only tend to clutter the emissions inventory, and generally would be of use only to the TACB section that is responsible for collecting the data in the first place.

Several categories of data are especially appropriate for an emissions inventory because they relate directly to emissions and because they are of use to several groups within and outside the TACB. These categories are as follows:

- Source identifiers are data elements such as facility names, addresses, phone numbers, names of personnel to contact at the facility, and emission point identification numbers. These identifiers are not really emissions data, but it is obvious that at least some of these data must be maintained within an emissions inventory matrix.

- Spatial coordinates define the physical point in space at which pollutant emissions are released into the atmosphere. The data are required principally for modeling purposes. These data include such items as latitude, longitude (or equivalent UTM coordinates), and stack height. Other supporting data may also be considered to be spatial coordinates indirectly. For example, gas temperature and stack exist velocity may be required to calculate effective plume height which is added to stack height to calculate an effective pollutant release height for modeling.

- Emissions descriptors are basic emissions data. They include pollutant names, such as carbon monoxide; they also quantify emissions in lb/minute or ton/yr, etc. Some supporting data may be considered to be in more than one category. For example, stack gas velocity was

shown above to be an input element for the determination of pollutant release height. However, stack gas velocity, stack diameter, and pollutant concentration can be used to calculate pollutant release rate. These three input elements may not be required in the emissions inventory when the pollutant release rate is included. Operating schedules and maximum emissions rates are required for modeling and should be included in the emission inventory in addition to total annual emissions.

- Compliance milestones are points in time at which events occur or are scheduled to occur. Such points of interest include permit application dates, construction initiation dates, start-up dates, compliance demonstration dates. These temporal data are mainly of interest to the Permits Section because such dates are routinely incorporated into construction permits. Sometimes particular milestone dates determine regulatory emission limits. These dates are also useful for Prevention of Significant Deterioration (PSD) increment consumption or baseline determinations. For example, sources are subject to NSPS depending on the type of source and the date on which construction of the source began. EPA can prescribe noncompliance penalities for sources who fail to meet agreed or mandated compliance schedules.

- Process and control equipment descriptions are data elements which can be used to a limited extent to verify emissions but which do not actually determine emissions. For example, a coal-fired boiler cannot meet NSPS with only a multicyclone for particulate control. Generally, a scrubber, a fabric filter, or an electrostatic precipitator would be required. Furthermore, the required size for the precipitator or the required size and pressure drop for the scrubber would depend on a rather detailed analysis of the properties of coal to be fired in the unit. In spite of the limitations in the usefulness of these data, process and control equipment descriptors may serve important functions in an emissions inventory. For example, an emissions offset may be obtained by voluntarily retrofitting an improved control device to a source that is already in compliance, and the proof of the offset might be preserved in historical emissions inventory records showing the old and new pollution control equipment. Another reason for the maintenance of these descriptors in an emissions inventory is that the Control Strategy Section requires a comprehensive data base to determine effects of potential retrofit regulations on emissions. It seems appropriate to maintain that data base within the emission inventory.

- Area source data are used in air quality models to represent emissions from all of the sources that are too small or too numerous to be counted as point sources. These sources include small businesses such as service stations and drycleaners, mobile sources, residential home heating, etc. Frequently, surrogate data are input to calculate certain types of emissions. For example, recreational boating emissions are calculated as a function of lake and bay acreage in a given area. Windblown dust is a function of miles of paved and unpaved roadway. Existing area source calculation programs have very well defined data requirements that are discussed elsewhere in this report.

Some categories of data are of questionable value for an emissions inventory. One such category is cost data for process equipment and for pollution control equipment. The Control Strategy Division has specific responsibility to determine economic reasonableness of potential or proposed controls for existing pollutant-emitting sources, but presently the division has very little involvement with costs. Division representatives have indicated that more emphasis should be placed on the determination of the relative cost-effectiveness of alternative control strategies, and TACB staff members have told us that little consideration was given to costs in developing the SIP. However, we do not feel that the costs are appropriate data elements for an emissions inventory. Our experience has shown that costs reported by various sources will not reflect a uniform accounting basis and that comparisons will require considerable study and manipulation if they are to be meaningful. Also, with rapid cost escalation, reported costs for previous installations are not a very reliable indication of present or future costs.

The Permits Section and the regional inspectors also place very little emphasis on costs. Sources presently do not have to report their costs for pollution control equipment installations. Sometimes costs are voluntarily reported in conjunction with a permit application, but the cost data are generally not used in any way by the TACB.

We conclude therefore that there is no legal or rational basis for incorporating cost data into an emissions inventory.

Although the Control Strategies Division is responsible for the development of cost-effective regulations, the cost data required by the Division should not be assembled within the emissions inventory.

Many processes that are subject to air pollution control requirements also have other waste streams, and some air pollution control systems have associated liquid or solid waste streams. Data for these streams are often included in the permit application for a source and thus may be available to the TACB through the Permits Section. Regulatory responsibility for these streams lies outside TACB's jurisdiction. The Permits Section may inform sources of their need to secure additional permits from other agencies such as the Texas Water Control Board, and the section may coordinate with other agencies regarding such permits. However, there does not appear to be merit in incorporating these rather incidental data in an emissions inventory.

FEDERAL REQUIREMENTS

National Emissions Data System

TCAA does not require TACB to collect or report emissions data in a National Emissions Data System (NEDS) format. CAA 77, however, requires the collection of significant quantities of emissions data. EPA responsibility for assembling this data base has been assigned to the National Air Data Branch (NADB) of the Office of Air Quality Planning and Standards. Pursuant to 40 CFR 51.323, the states are required to make annual reports of major point sources ($\geq$ 100 tons/year) to NADB. The reports will indicate emissions of Total Suspended Particles (TSP), sulfur dioxide, carbon monoxide, nitrogen dioxide, and hydrocarbons, as coded into the NEDS on point source coding forms. The submission of annual reports for area sources by the states to NADB is only voluntary. Thus, TACB is not required to update area source inventories for reporting to NEDS.

The procedures for accurately coding point source information into the NEDS system are fairly involved. A complete description of NEDS and the correct coding methods are presented in Aerometric and Emissions Reporting Systems (AEROS) Manual Series, Volume II, AEROS Users Manual, U.S. Environmental Protection Agency, Office of Air and Waste Management, Research Triangle Park, N.C. EPA-450/2-76-029 December 1976.

Compliance Data System

TCAA gives the TACB responsibility for insuring that sources comply with the provisions of the Act (Section 3.07). This requires that TACB be aware of the compliance status of all affected sources in the state of Texas.

Section 110 of CAA 77 requires TACB to submit quarterly compliance reports to the EPA. This requirement does not specify that the information be in the Compliance Data System (CDS) format. CDS was developed for internal use by EPA's Division of Stationary Source Enforcement. Although the states are not required by law to submit information in CDS format, EPA has asked that the quarterly data submission be compatible with CDS.

National Emission Standards For Hazardous Air Pollutants

TCAA Regulation VI requires that existing or proposed facilities meet the requirements of Section 112, National Emission Standards for Hazardous Air Pollutants (NESHAPS), of CAA 77. As a consequence of this regulation the TACB will have to maintain some record of hazardous air pollutant emissions from Texas facilities. TCAA does not specify that the TACB collect, maintain, nor report hazardous emission data in NESHAPS format.

Hazardous and Trace Substance Emission System

CAA 77 requires hazardous pollutant enforcement (Section 112), general enforcement actions (Section 113), and inspection/monitoring and recordkeeping (Section 114) by EPA. Pursuant to

40 CFR 51.323 each state shall submit an annual report of emissions of hazardous material into the Hazardous and Trace Substance Emission System (HATREMS). HATREMS, like NEDS, is a subsystem of the AEROS data management system. At present, regulations only require reporting of emissions of lead or lead compounds, measured as elemental lead, into HATREMS. The number of pollutants subject to HATREMS reporting requirements will undoubtably increase in the future. The TACB emissions inventory system should have the flexibility to handle future HATREMS pollutants. Data submission to HATREMS closely parallels that required for NEDS. A complete description of HATREMS and the correct coding methods are presented in the AEROS Manual Series, Volume II AEROS User's Manual. U.S. Environmental Protection Agency, Office of Air and Waste Management, Research Triangle Park, N.C. EPA 420/2-76-029. December 1976.

SECTION 3

PERMITS AND SOURCE EVALUATION DIVISION REQUIREMENTS AND ASSISTANCE

PURPOSE OF PERMITS AND SOURCE EVALUATION DIVISION

The Permits Section of the Permits and Source Evaluation Division (PSED) is responsible for the evaluation and revision of industry permit applications, for the issuance of permits to construct and permits to operate air pollutant emitting processes, and for the maintenance of permit records. The Source Evaluation Section is responsible for the determination and evaluation of emissions from sources, via sampling, for the quality assurance of all TACB source sampling work, and for the conduct of the TACB Visible Emissions Evaluation Training Course throughout the state.

Sections 3.27 and 3.28 of the Texas Clean Air Act (TCAA) specify that the person in charge of any new or modified facility which will emit air contaminants must obtain a construction permit from the TACB before actual work is begun on the facility. Before such a permit is granted, the facility must present evidence that the "proposed construction will comply with applicable air control standards and the intent of the Texas Clean Air Act". Within 60 days after a facility is constructed and put into operation the person in charge of that facility must apply for an operating permit. He may be required to submit data to demonstrate compliance with applicable TACB rules and regulations and with the TCAA. The TACB has the power to seek an injunction to halt the operation of any facility operating in violation of the terms of the facility's permit. Thus, the Permits and Source

Evaluation Division has specific authority to obtain emissions data which may be useful to the Emissions Inventory Section.

EMISSIONS DATA USED BY THE PERMITS AND SOURCE EVALUATION DIVISION

Permit application data should be incorporated in the emissions inventory as soon as a source begins operation. Thus, the Permits Section should be an important data resource for an emissions inventory system. Each source must submit performance test data to the Permits Section to obtain an operating permit. These data are routinely evaluated by the Source Evaluation Section and can be input to the Emissions Inventory Section as basic emissions inventory data which have been verified for that source.

To determine whether to grant a construction or operating permit to a source, the Permits Section requires emissions data for neighboring sources. These data are used to model ambient air quality. Such data should be available from the Emissions Inventory Section, but because such data are not presently available, the Permits Section has developed their own data sets for modeling SO_2 in five heavily industrialized counties. Those counties are Jefferson, Orange, Harris, Galveston, and Nueces. The data for each facility in those counties are updated each time the facility applies for a new permit. SO_2 data elements which are contained in the data decks are shown in Table 1.

The Permits and Source Evaluation Division has the responsibility to carry out several EPA mandates as part of the TACB permit review process. All new sources are subject to NSPS, and some sources are subject to NESHAPS. Furthermore each new source must incorporate Best Available Control Technology (BACT). Sources to be located in nonattainment areas must achieve the Lowest Achievable Emissions Rate (LAER) for the industry and source. Emissions offsets must be secured and documented as part of the permitting process for each source proposing to locate in a nonattainment area. The Permits Section also implements State Implementation Plan (SIP) requirements and maintains data that

TABLE 1. PSED SO_2 DATA ELEMENTS REQUIRED FOR PLANT PERMITS

Data Elements	Units
STATIONARY POINT SOURCE	
I. Facility identification	
A. name	
B. address	
C. city	
D. state	
E. zip code	
F. AEROS codes	
1 - state	
2 - county	
3 - AQCR	
4 - plant ID	
G. UTM Zone	
II. POINT SOURCE IDENTIFICATION	
A. ID number	
B. SIC number	
C. UTM coordinates	
1 - horizontal	kilometers
2 - vertical	kilometers
III. POINT SOURCE EMISSIONS AND STACK PARAMETERS	
A. emission rate	grams/sec
B. stack height	meters
C. stack diameter	meters
D. stack gas velocity	meters/sec
E. stack temperature	degrees kelvin

the Control Strategy Division can use in documentation of RFP toward the attainment of National Ambient Air Quality Standards (NAAQS).

Section 111 of CAA 77 includes uniform nationwide NSPS for new and modified stationary sources. Standards may apply to specific equipment and processes, or to entire plants and facilities [Section 111 (b) (2)], and may be revised whenever necessary. Standards are set only in terms of emissions rather than specific control devices. Compliance is determined by an actual measurement of emissions. No variances or exemptions to the regulations can be granted; standards must be met at all times during normal operation, but start-up, shutdown, and malfunction periods are provided for in specific regulations.

Section 114 of CAA 77 may require an owner or operator to keep records, make reports, monitor, sample emissions, and provide other information to EPA or to states to whom EPA delegates authority. The scope of this information is quite broad, including that which the administrator of EPA "may reasonably require." CAA 77 also grants EPA and its delegates rights of entry, access to records and monitoring systems, and authority to sample emissions.

TACB Regulation VI specifically requires incorporation of federal NSPS technology for all new or modified sources for which such standards have been promulgated. The Permits and Source Evaluation Division is responsible for insuring that new sources are constructed and operated to meet NSPS. In order to support permitting activity to regulate NSPS, TACB should have the following essential data:

- A list of source categories for which NSPS have been promulgated. This list should be kept current as standards are developed for additional source categories.
- For each source category, a list of "affected facilities." "Affected facility" is used in NSPS regulations to identify the equipment/system/process to which these

regulations apply. This concept permits full utilization of the authority in Section 111(b) (2) to distinguish among classes, types, and sizes within categories. Affected facilities range from process equipment (cement plant kilns) to entire plants (asphalt, concrete, nitric acid). Some NSPS exempt facilities below a specified size (steam generators, storage tanks). Distinction may also be made between the materials used (different standards for coal, oil, and gas-fired steam generators) or the material produced (different electric arc furnace standards for ferroalloys and steel production).

EPA established the emissions offset policy for the purpose of allowing economic growth to continue in areas with air quality worse than the National Standards. The offset policy was incorporated in Section 129 of the CAA 77 and was to remain in effect until June 30, 1979, at which time the offset policy was to be superseded by State-developed provisions for new source review (NSR) in nonattainment areas. Texas devised a NSR program which involved in part the continuation of the federal case-by-case offset approach. However, Texas policy is not identical in all respects to the federal offset policy. The federal policy prescribed NSPS, BACT, NESHAPS, LAER, offsets, and modeling to demonstrate that NAAQS will not be exceeded. Most of these factors are also enumerated in the proposed Texas SIP revisions.

Texas has addressed new source growth managment in the 1979 SIP revisions. TACB has proposed in the SIP revisions to manage new source growth in nonattainment areas through Regulation VI for all major new emissions sources or major modifications.

Regulation VI construction permit requirements include:

- an emissions limit for particulate matter
- no significant deterioration of existing ambient air quality
- emissions monitoring requirements
- utilization of Best Available Control Technology (BACT)
- utilization of NSPS
- fulfillment of NESHAPS requirements
- compliance demonstration

- Section 129(a)(1) of CAA 77 (all requirements)
- Requirements for new Volatile Organic Compounds (VOC) sources after June 30, 1979
  - LAER
  - All applicant sources in compliance or on a compliance schedule
- Provision of data regarding expected emissions for TACB determination of RFP in specific counties
- Emissions offset for VOC sources in ozone nonattainment areas.
- Requirements for new non-VOC sources having significant contribution
  - LAER
  - All state and federal emissions regulations
  - Cannot cause NAAQS exceedence or significantly contribute to an existing exceedence

Regulation VI operating permit requirements include:

- demonstration of compliance with regulations
- demonstration that source meets construction permit requirements
- demonstration that source meets NSPS, if applicable
- demonstration that source meets NESHAPS, if applicable.

Additional requirements in consideration of permits are that emission reductions may be used as offsets if:

- They are not required by a SIP provision
- Adequate documentation is provided, including:
  - Offset facility location and identity
  - Chemical composition of reduced emissions
  - Date of emissions reduction
  - Quantity of reduction in ton/yr and lb/hr
  - Description of reduction method
  - Certification that reductions are genuine and are not being used for duplicate offsets
  - Other information that may be requested.

Offset emissions reductions are incorporated into construction permit conditions and are enforceable. The applicant for a permit is burdened to maintain all records of emissions offset credits, not the TACB.

On the basis of these TACB regulatory requirements it appears that the Permits Section must rely heavily on emissions data in order to be able to determine whether or not a source should be given a construction permit. Data elements which the Permits Section gathers in conjunction with New Source Review from the permit application are as listed in Table 2.

FEDERAL MANDATES

Significant Deterioration

Regulation VI construction permit requirements include a determination that a proposed source will not contribute to significant deterioration of ambient air quality. However, the TACB has not adopted a formal definition of significant deterioration. Decisions to grant construction permits are based on the evaluation of the proposed source's air quality impact on the National Ambient Air Quality Standards. Considerations to increment consumption for sources of SO_2 and particulate matter are currently not given since the TACB has not adopted federal prevention of significant deterioration regulations. These regulations are currently being administered and permits issued by EPA Region VI. The TACB, as most other state agencies, is currently involved in the preparation of a SIP revision for the delegation of PSD to the state. At present sources which are subject to federal PSD review must obtain both a state construction permit and a federal PSD permit.

In order for TACB to determine whether to issue a construction permit, the agency or the source must model all sources in the area to determine attainment or nonattainment. Also, TACB must model the proposed source to determine the significance of its atmospheric impact. TACB must evaluate modeling results to

TABLE 2. PLANT EMISSION DATA BY ELEMENT - INFORMATION SPECIFIED BY PSED

Data Elements	Units
STATIONARY POINT SOURCE	
I. Facility identification	
A. name	
B. address	
C. city	
D. state	
E. zip code	
F. AEROS codes	
1 - state	
2 - county	
3 - AQCR	
4 - plant ID	
G. UTM Zone	
II. POINT SOURCE IDENTIFICATION	
A. principal company business	
B. SIC code	
C. SCC code	
III. PROCESS IDENTIFICATION	
A. type process	
B. permit number	
C. facility name	
D. facility identification number	
E. location	
1 - latitude	
2 - longitude	
3 - AQCR	
F. construction permit date	
G. construction completion date	
H. operating permit date	
I. operating startup date	
J. operating schedule	
1 - hours/day	
2 - days/week	
3 - weeks/year	
K. process production rate	tons/year
L. products name and output	ton/hour each

TABLE 2. (continued)

IV.	POLLUTANT IDENTIFICATION	
	A. pollutant name	
	B. pollutant quantity	ton/year
	C. maximum pollutant allowable	ton/year
V.	POINT SOURCE EMISSIONS AND STACK PARAMETERS	
	A. emission point number	
	B. stack height (above ground level)	feet
	C. stack elevation	feet
	D. stack diameter (internal)	feet
	E. stack exit temperature	°F
	F. stack exit velocity	feet/sec
	G. stack moisture	percent
VI.	OPERATING UNITS IDENTIFICATION	
	A. pollutant control device type	
	1 - manufacturer and model	
	2 - costs	
	a. capital installed	
	b. annual operating	
	3 - design removal efficiency (each pollutant)	percent
	B. gas stream idenficiation	
	1 - flow rate (input and output)	acfm
	2 - temperature (input and output)	°F
	3 - static pressure (input and output)	psig
	4 - composition (input and output)	percent or ppm
	C. wet scrubbers	
	1 - scrubbing liquid name	
	a. flow rate	gal/min
	D. fuel(s) identification	
	1 - fuel(s) input	
	2 - gross heating value of fuel(s)	unit/year
	3 - boilers and heaters (average fixed rate)	Btu/unit
	4 - chemical composition of fuels	
	E. heat transfer identification	
	1 - type of transfer medium	
	a. temperature (input and output)	degrees F
	b. pressure (input and output)	psia
	c. flow rate (average and maximum)	feet/sec
	F. storage tank identification	
	1 - location	
	a. latitude	
	b. longitude	

TABLE 2. (continued)

2 - identification number	
3 - capacity	barrels
4 - dimensions	
a. diameter	feet
b. height	feet
c. length	feet
5 - materials of construction	
6 - type of tank	
a. floating roof (type and seal)	
7 - vent valve date	
a. type	
b. number	
c. pressure setting	
d. vapor disposal method	
8 - storage temperatures	degrees F
9 - type of storage material (liquids, gases, vapors)	
a. vapor pressure	
b. density	
c. boiling point	degrees F
10 - maximum filling rate	
11 - average throughput	
12 - tank turnovers/year	
G. flare identification	
1 - identification number	
2 - waste gas stream composition	
3 - minimum flow rate	scfm
maximum flow rate	scfm
average flow rate	scfm
4 - fuel added to flare	
5 - flare height, diameter (inside)	feet
6 - costs	
a. capital installed	
b. annual operating	
7 - particulate matter produced	
a. particle size distribution	
H. Special collection data for:	
1 - cyclone separators	
2 - fabric filters	
3 - electrostatic precipitators	
4 - wet washers	
5 - absorbers	
6 - spray booths	
7 - rock crushers	
8 - asphaltic concrete plants	
9 - metal melting furnace	
10 - petroleum production facility	
11 - cotton ginning	
12 - abrasive blast cleaning	

identify the new plant's potential for causing a nonattainment air quality status to be reached and it must assess the need for offsets and the validity of any proposed offsets. Thus the Permits Section relies heavily on emissions inventory type data which they have generated over the past several years but which are not maintained within the TACB's Emissions Inventory Section.

Proposed federal PSD regulations will necessitate the development of a baseline ambient air quality emissions inventory concurrent with the first application for a PSD permit within each AQCR. This baseline inventory is used to model ambient air quality and to determine the allowable air quality increments that can be consumed in the future by new and existing sources in each area.

Sections 160 through 168 of CAA 77 provides the legal justification to TACB for the tracking of PSD increment consumption, but CAA 77 does not specifically identify the reporting requirements necessary to establish baseline and to track increment consumption. However, to develop an adequate data base for all criteria pollutants which will be consistent with NSR requirements, TACB should maintain the minimum data elements described below for all sources in an AQCR for the year in which the baseline date is established. The proposed baseline date would be the date after August 7, 1977, of the first application for a permit in an area subject to PSD increment limitations. PSD now includes suspended particulate and SO_2, but may increase in the future to include other criteria pollutants.

- Facility identification - facility name, address, state, county, AQCR, plant identification number, UTM zone
- Point source identification - point source identification number, SIC number, UTM coordinates, normal operating schedule
- Point source emissions - date of (baseline) record, SCC code, pollutant identification number, tons per year and/or lbs per hour. The emissions are to include the following:

- Actual emissions, from all existing sources at the time of the baseline date

- Allowable emissions, from all sources under construction or modification before January 6, 1975, but which were not operating by baseline date

- Allowable emissions, from existing sources affected by State Implementation Plan (SIP) relaxations pending as of August 7, 1977

Table 3 is a list of the actual data elements necessary to determine baseline emissions.

Allowable Increment Tracking

In order to track increment consumption as a result of changes in emissions, it will be necessary to account for variations in all point source emissions throughout each AQCR. This will require routine updating of the point source emission inventory within each AQCR.

The following types of emissions will consume increments:

° Actual emissions, any change in emissions from sources contributing to the baseline

° Allowable emissions, from all new major source construction or modification after January 6, 1975

The list of the actual data elements which should be updated in order to track increment consumption are also shown in Table 3.

It will be necessary to maintain an up-to-date emissions inventory. This will assure that the data given to permit applicants be as current as possible.

Data Requirements For Modeling

TCAA does not identify modeling as a means for achieving specific objectives, but the Permits Section regularly uses air quality modeling programs in order to evaluate permit applications. The Permits Section uses and maintains source decks which they have assembled in order to perform this modeling work. Data elements necessary for modeling have been identified in Table 4.

TABLE 3. FEDERAL CLEAN AIR ACT DATA REQUIREMENTS MANDATED BY PSD

BASELINE EMISSION LEVEL

Data elements	Number of characters	Units
STATIONARY POINT SOURCE		
I. Facility identification		
A. name	~25	
B. address	~20	
C. city	~10	
D. state	2	
E. zip code	5	
F. AEROS codes		
1 - state	2	
2 - county	4	
3 - AQCR	3	
4 - plant ID	4	
G. UTM zone	2	
II. Point source identification		
A. ID number	3	
B. SIC number	4	
C. UTM coordinates		
1 - horizontal	xxx.xxx (6)	kilometers
2 - vertical	xxx.xxx (7)	kilometers
D. normal operating schedule	4	hours/year
III. Point source emissions		
A. baseline date	xx/xx/xx (6)	
B. SCC code	x-xx-xxx-xx (8)	
C. pollutant code	5	
D. annual emission rate		
1 - amount	7	tons/year
2 - type	actual allowable	
E. hourly emission rate		
1 - amount	xxxx.xx (6)	lbs/hr
2 - type	actual allowable	

TABLE 3. (continued)

TRACKING INCREMENT CONSUMPTION

Data elements	Number of characters	Units
IV. Point source emissions (update)		
A. date of record	xx/xx/xx (6)	
B. SCC code	x-xx-xxx-xx (8)	
C. pollutant code	5	
D. annual emission rate		
amount	7	tons/year
type	actual allowable	
E. hourly emission rate		
amount	xxxx.xx (6)	lbs/hr
type	actual allowable	

MODELING

V. Point source emissions and stack parameters		
A. emission rate	xxxxx.xxx	grams/sec
B. stack height	4	meters
C. stack diameter	xx.xx (4)	meters
D. exit gas velocity	xxxxx.xx (7)	meters/sec
E. exit gas temp.	xxxxx (5)	degrees C

EMISSION PROJECTIONS

VI. Facility emission total		
A. date of record	xx/xx/xx (6)	
B. pollutant code	5	
C. annual emission rate	7	tons/year

AREA SOURCE

VII. Area source identification	
A. name of county	10
B. AEROS code	
1 - state	2
2 - county	4
3 - AQCR	3

TABLE 3. (continued)

C.	area source category identification		
	1 - NEDS area source category name	33	
	2 - area source category emissions		
	a - date of record	xx/xx/xx (6)	
	b - pollutant code	5	
	c - annual emission rate	7	tons/year

TABLE 4. DATA REQUIREMENTS FOR AIR QUALITY MODELING

MODELING

Data elements	Number of characters	Units
STATIONARY POINT SOURCE		
I. Facility identification		
A. name	~25	
B. address	~20	
C. city	~10	
D. state	2	
E. zip code	5	
F. AEROS codes		
1 - state	2	
2 - county	4	
3 - AQCR	3	
4 - plant ID	4	
G. UTM zone	2	
II. Point source identification		
A. ID number	3	
B. SIC number	4	
C. UTM coordinates		
horizontal	xxx.xxx (6)	kilometers
vertical	xxxx.xxx (7)	kilometers
D. normal operating schedule	4	hours/year
E. point source emissions		
1. baseline date	xx/xx/xx (6)	
2. SCC code	x-xx-xxx-xx (8)	
3. pollutant code	5	

TABLE 4. (continued)

III. Point source emissions and stack parameters

Data elements	Number of characters	Units
A. emission rate	xxxxx.xxx	grams/sec
B. stack height	4	meters
C. stack diameter	xx.xx (4)	meters
D. exit gas velocity	xxxxx.xx (7)	meters/sec
E. exit gas temp.	xxxxx (5)	degrees C

IV. Facility emission total

A. date of record	xx/xx/xx (6)	
B. pollutant code	5	
C. annual emission rate	7	tons/year

AREA SOURCE

V. Area source identification

A. name of county	10	
B. AEROS code		
1 - state	2	
2 - county	4	
3 - AQCR	3	
C. area source category identification		
1 - NEDS area source category name	33	
2 - area source category emissions		
a - date of record	xx/xx/xx (6)	
b - pollutant code	5	
c - annual emission rate	7	tons/year

These data elements were found to meet the requirements of three models: the Texas Episodes Model, the Texas Climatological Model, and EPA's RAM Model. It is expected that the data would also meet requirements of most other models, but specific requirements should be checked for any other models that are contemplated for use.

Emissions Offset and Banking

TCAA Section 3.27 requires that new facilities and modified existing facilities that would increase air contaminant emissions must submit information to the TACB for new source review and must obtain a permit before construction is begun. In addition a new facility that proposes to locate in a nonattainment area for which there is no approvable SIP is subject to EPA's Emission Offset Interpretative Ruling published in the Federal Register, volume 44, page 3274, on January 16, 1979, effective until July 1979. The main provisions of this ruling require the new source to meet the lowest achievable emission rate (LAER), and to obtain more than equivalent offsetting emission reductions from existing sources such that a net positive air quality benefit will result. All states are required by CAA 77, Sections 172 and 173, to carry out the emission offset program as a part of the state new source review system.

Necessary emission offsets may be accomplished at the same facility as the new source or at neighboring sources. The offsets are usually obtained from sources controlled by the new facility owner. The emission offset must be enforceable by authorized state and/or local agencies under CAA 77, and must be accomplished by the new source startup date.

The permit applicant is responsible to submit various data to TACB in support of emission offsets so that the TACB can determine the validity of the proposed offset. Because the burden for proof is on the part of the applicant, TACB has no legal need for emissions inventory data in this regard. However, it is apparent that if data for the source that is to provide the

proposed offset were in the emissions inventory the data would be useful to TACB for validation of the proposed offset. Emissions offset banking is allowable if a facility elects to reduce air contaminant emissions prior to the time the facility may wish to construct a new source. This policy encourages the utilization of advanced technology to reduce air contaminant emissions whenever new technology becomes available. Such a reduced emission would constitute a banked emission offset. Also a facility may wish to shut down an emission source prior to need for an offset. TACB Regulation VI designates that offset recordkeeping is a specific responsibility of the source and not of the TACB. Thus TACB is precluded from incorporating special provisions in the emissions inventory for monitoring offset banking. If TACB decides to change its policy and to maintain records of banked offsets, it appears appropriate that such records should be incorporated in an emissions inventory. Those banked emissions are in effect allowable emissions and should be included in any air quality modeling exercises performed by the TACB for nonattainment areas.

The permit applicant must document that a proposed offset source was either in existence on August 7, 1977, or was granted a permit to operate subsequent to that date. Suitable documentation includes source test reports or data reported in a previous emissions inventory. Such data would be verified by TACB regional field personnel. The following guidelines were indicated by TACB for verification of emission offsets.

- If an emission source is shut down, a field inspector verifies that the source has been physically removed or that it has been made permanently inoperable.

- If emissions are reduced, stack test results are required. If the reduction is accomplished by a process change, new production rates must be established. If the reduction results from adding a new control device, the operating parameters of the device are reviewed and evaluated. A new allowable limit for the source is then incorporated into the operating permit for the source.

BACT and LAER

TACB Regulation VI requires that before a construction permit can be granted a number of conditions must be met by the new facility, including the utilization of Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating atmospheric emissions resulting from the facility.

TACB does not need emissions inventory data in order to make BACT determinations. BACT determinations are made on a case-by-case basis using previous BACT determinations as a guide, and using good engineering judgment as to the exact amount of emission reduction required. If no previous BACT determinations have been made for a certain type of source, one guideline is that by definition, BACT cannot be less stringent than NSPS or NESHAPS requirements.

BACT is a continuously moving concept. Current BACT will not be BACT in the future because of advances in control technology and new applications (technology transfer) of that technology. Any system devised to track BACT will have to be flexible and readily amenable to change. If the system is to be useful to the user and is to have the user's confidence it must be frequently updated.

TACB regulation VI prescribes that after June 30, 1979, the owner or operator of a proposed new facility (or major modification) that is a major stationary source of emissions of any air contaminant for which a NAAQS has been issued, must meet additional requirements if the source's emission would contribute significantly to a predicted exceedance of that standard or would contribute significantly to an existing exceedance. Among these requirements, the proposed facility must comply with the lowest achievable emissions rate (LAER) that has been accomplished in practice by that particular industry and source. CAA 77 requires that LAER incorporate the most stringent emission limits that are embodied in any SIP, or that are achieved in practice, and in no

event can LAER be less stringent than an applicable NSPS limitation. To make a LAER determination for a given class or category of sources, the permit reviewer must have current information on (1) all applicable SIP limitations in the country, (2) the lowest emission rates achieved in practice by such class or category of source, and (3) applicable NSPS limitations.

LAER control technology is evolutionary in nature and is subject to frequent change. As new and improved technologies or processes are demonstrated and practiced, they must be recognized, used, and incorporated into the system. EPA is now developing a document to track and update LAER technology on a regular basis.

Emissions inventory data are not required to make BACT and LAER determinations. The Permits Division will make these determinations in order to decide whether or not to issue a permit. Once the source becomes operational and is loaded into the emissions inventory there is no need to flag that source as a BACT or LAER source. The Control Strategy Division does not require any indication that a source is BACT or LAER; that division can scan actual emission rates for particular sources in the emissions inventory to determine achievable emissions rates for control strategy planning purposes.

Information Required To Meet NESHAPS Requirements

Section 112 of CAA 77 provides for the establishment of NESHAPS. EPA defines hazardous air pollutant as "an air pollutant to which no ambient air quality standard is applicable and which in the judgment of the Administrator causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness." Thus the Administrator must prescribe NESHAPS for each hazardous pollutant at a level judged to provide an ample margin of safety to protect the public health. NESHAPS apply to new as well as existing air pollution sources. All proposed new sources are subject to

control immediately upon promulgation of a standard, and all existing sources must comply with a standard within 90 days of promulgation unless granted an extension.

TCAA does not set forth specific methods to enforce NESHAPS, but Texas law says that "emissions from a proposed facility will meet, at least, the requirements of any applicable emission standards for hazardous air pollutants by the EPA." To enforce NESHAPS, TACB must have a list of Texas sources that are subject to regulation. Asbestos, beryllium, mercury, and vinyl chloride are now subject to these rules.

According to 40 CFR 61, amended by 44 FR 55174 (September 25, 1979), owners or operators of sources are required to submit the information shown in Table 5 to EPA prior to 90 days after the effective date of any standards or amendments which require the submission of such information. In order to enforce NESHAPS an emissions inventory is not necessary.

EPA Methods 101, 102, and 104 must be used for all source tests that are required under these regulations.

NESHAPS data do not need to be incorporated into the emissions inventory immediately. It seems appropriate to leave the data out for now to expedite the inventory of criteria pollutants.

CONCLUSION - PERMITS AND SOURCE EVALUATION DIVISION

Data requirements in conjunction with the permitting of new sources are comprehensive. These data would probably be sufficient to meet all emissions inventory requirements for each new source that becomes operational. The data include pertinent source identifiers, spatial coordinates, emissions descriptors, and process and control equipment descriptors. For air quality modeling, the division requires data for surrounding point source facilities as well as for area sources. The modeling effort requires timely and accurate emissions data. The Permits and Source Evaluation Division is an important resource for the updating of an emissions inventory.

TABLE 5. NESHAPS DATA REPORTING REQUIREMENTS

Data elements	No. of characters	Units
I. Source Information		
A. Identification/location		
1. name of each source	20	N.A.
2. address of each source	2	N.A.
3. city	15	N.A.
4. region	2	N.A.
5. state	2	N.A.
6. county	12	N.A.
7. source number	5	N.A.
8. AQCR	3	N.A.
9. SIC	4	N.A.
B. Contact		
1. name	15	N.A.
2. telephone number	10	N.A.
C. Source description		
1. description	25	N.A.
D. Alternative mailing address		
1. street	20	N.A.
2. city	14	N.A.
3. state	2	N.A.
4. zip	5	N.A.
E. Compliance status		
1. Can source meet emission limitations	XXX	N.A.
II. Process information for each emission point and each hazardous pollutant.		
A. Pollutant emitted	2	N.A.
B. Process description	25	N.A.
C. Amount of pollutant	Variable	lb/mo
D. Control device		
1. primary device	16	N.A.
2. percent removal	3	%
3. secondary device	16	N.A.
4. percent removal	3	%

TABLE 5. (continued)

Data elements	No. of characters	Units
III. For Asbestos Emission Control Devices Only		
A. If a fabric filter is specified in II. D.		
1. air flow permeability	Variable	cfm/ft^2
2. operating pressure drop	2	in. W.G.
3. if fabric filter material contains synthetic fill yarn, check if this material is spun or not	3	N.A.
4. if fabric filter utilizes felted fabric, indicate		
thickness	2	in.
density	2	$oz./yd^2$
B. if a wet collection device is specified in II. D.		
unit contracting energy	2	in. W.G.
IV. Disposal of Asbestos Containing Wastes		
A. Brief description of process that generates wastes	30	N.A.
B. Asbestos concentration	4	%
C. Amount of waste	7	kg/d
D. Control method	35	N.A.
E. Waste disposal		
1. type of site (landfill, incinerator)	45	N.A.
2. operator name	50	N.A.
3. address	50	N.A.
V. Waste Disposal Site		
A. For each site		
1. name of site	19	N.A.
B. Description of site	40	N.A.
1. distance to closest town	5	km
2. distance to closest residence	5	km
3. distance to closest road	5	km

SECTION 4

COMPLIANCE DIVISION REQUIREMENTS AND ASSISTANCE

PURPOSE OF THE COMPLIANCE DIVISION

Section 3.07 of TCAA permits the TACB to institute legal proceedings to compel compliance with the provisions of the TCAA or the rules, regulations, orders, variances, or other decisions of the TACB. The EPA requires the TACB to develop and submit a State Implementation Plan (SIP) to the EPA incorporating requirements of CAA 77 and federal regulations promulgated by the EPA in accordance with CAA 77.

The TACB Compliance Division has the responsibility to ensure that the rules, regulations, orders, and provisions of the board are enforced throughout the state in an equitable and consistent manner. The specific duties of this division are:

- Coordination of enforcement activities beginning with the initial source investigation to litigation, if necessary, working closely with the twelve regional offices and local programs.
- Evaluation of installation time requirements, operating efficiencies, and overall capabilities of air pollution control devices for use in enforcement proceedings.
- Development and assessment of agency policies regarding upset and maintenance activities at industrial sources.
- Maintenance of division files including Source Investigation System (SIS) data for division support and for public information purposes.
- Preparation of reports for TACB and submission to EPA.

Source inspections are performed by regional office personnel for many purposes such as complaints, sampling, Rules VII &

VIII, NSPS, NESHAPS, and SIP inspections. Some inspections are brief, but SIP inspections are quite thorough. The inspection is a good opportunity to review and update all emissions data for the facility.

COMPLIANCE DIVISION DATA REQUIREMENTS

The Compliance Division does not need emissions inventory data to perform its duties, but the division can perform those duties more efficiently if an up-to-date emissions inventory is available. An emissions inventory helps field inspectors to become familiar with all sources at each facility in their jurisdiction, enables them to compare reported efficiencies of control equipment with data for other similar sources, and helps the inspectors to categorize major sources by size within specified industries.

TCAA and CAA 77 do not address TACB's Source Investigation System (SIS) data collection program, and therefore neither act places any legal requirements for data acquisition through the SIS. The computerized SIS is used to record, store, and retrieve data which are reported principally by field investigators. Various local health departments and the central TACB Compliance Division also provide some data to the system. The data thus collected are stored in the computer where they can be output in any of several different report formats. Approximately 20,000 input documents and 350 output reports are processed by the system each year. This system collects data at the sources and does not require emissions inventory data for its operation. Potentially, collected data could be input to update an emissions inventory.

Information about each source or facility is divided into three sections: permanent information, investigation data, and administrative data. Permanent information includes an account status identifier, the company name, location, facility category, and significant pollutants. In addition, flags are provided for

EPA reporting purposes. Investigation data are uniquely identified within each account by the date of investigation. The following data may be collected depending on the activity of the investigator: type of investigation, the investigator's name, the person contacted at the company, the complaints received, findings, sampling information, and notes regarding air pollutant emission violations.

Administrative action notes and flags are usually submitted as a result of an investigation and include scheduled future actions, Compliance Division action requests, an indication whether an abatement letter was sent, recommendations to the Permits Section, and regional emissions inventory estimates by pollutant in tons per year. Though not part of the system itself, a narrative of details of the investigation is attached to almost every SIS report.

Supplementary input forms are used by central office personnel to read data regarding legal actions, additional complaints, compliance status, and NEDS account numbers for reporting to EPA.

Eight different SIS output report formats are available. Most of these formats are further modified by various selection and sorting capabilities, allowing determination of specific values for items such as regions, dates, emission status, etc.

The report formats include (1) the SIS Accounts Log, (2) the Investigation Report Summary by region, (3) Complaint Number Log, (4) SIS Master Accounts List, (5) the SIS Quick Look Report, (6) the SIS Audit Report, (7) the Entry Profile Report showing all permanent information on the source selected, and (8) the Scheduled Action Summary showing the actions scheduled for the following month.

Many emissions inventory data elements would be useful to TACB regional investigators in preparation for scheduled source visits. Output data for each source would enable the investigator to familiarize himself with a facility in advance of a plant visit. Some of the data would also help to satisfy part of the

SIS reporting requirements. Emissions inventory data elements common to the SIS are given below:

- Facility identification - facility name, address, state, county, plant identification number.
- Source identification and description for representative sources - SCC code, pollutant code, actual and allowable emissions.

Compliance Tracking And Demonstration Of Compliance

As part of their permit requirements, all sources must report the date of installation of new or modified pollution control devices and the date of compliance demonstration. The TACB regional offices track installation of control devices and verify compliance for all permitted sources. If the inspector finds a source in violation during any visit to a facility he issues the source a Notice Of Violation (NOV). After several NOVs if the source is still not in compliance, the source operator is asked to meet with regional personnel to formulate a compliance schedule and to identify milestones showing progress toward compliance.

Facilities under construction must submit quarterly reports to TACB on construction progress; after a control device is installed, the facility is required to demonstrate compliance by a stack test and to submit a test report to the TACB regional office. The TACB Source Evaluation Section may also conduct independent stack tests in cases where results reported by the source are questionable. Each stack test report is reviewed by the Source Evaluation Section and filed with the TACB Emissions Inventory Section.

EPA Reporting Requirements

The Compliance Division submits the following monthly reports to the EPA:

EPA reporting purposes. Investigation data are uniquely identified within each account by the date of investigation. The following data may be collected depending on the activity of the investigator: type of investigation, the investigator's name, the person contacted at the company, the complaints received, findings, sampling information, and notes regarding air pollutant emission violations.

Administrative action notes and flags are usually submitted as a result of an investigation and include scheduled future actions, Compliance Division action requests, an indication whether an abatement letter was sent, recommendations to the Permits Section, and regional emissions inventory estimates by pollutant in tons per year. Though not part of the system itself, a narrative of details of the investigation is attached to almost every SIS report.

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Many emissions inventory data elements would be useful to TACB regional investigators in preparation for scheduled source visits. Output data for each source would enable the investigator to familiarize himself with a facility in advance of a plant visit. Some of the data would also help to satisfy part of the

- SIP inspections showing compliance status.
- Notices of violation issued.
- Enforcement actions
- NSPS and NESHAPS Reports.

EPA requires the Compliance Division to maintain an adequate priority source file for all major SIP sources; the file must include the following listed in Table 6.

An emissions inventory is not required for the Compliance Division to compile the above data. The data are collected by the regional office inspectors and stored in the computer in the SIS system. It is not necessary to store these data in the emissions inventory because all TACB groups have access to these SIS data. However, the regional investigators can provide pertinent update information to an emissions inventory and can also verify emissions inventory data in conjunction with their regular inspections.

TABLE 6. TACB MAJOR SIP SOURCE INFORMATION FILE AS MANDATED BY EPA

Data Elements

STATIONARY POINT SOURCE

I. Facility identification

A. name
B. address
C. city
D. state
E. zip code
F. AEROS codes
   1 - state
   2 - county
   3 - AQCR
   4 - plant ID
G. UTM Zone
H. facility type, standard industrial class

II. COMPLIANCE INFORMATION

A. air program designation (SIP, NSPS, NESHAPS, PSD)
B. air program status
C. facility size category
D. facility compliance status
E. facility description
F. predominant pollutant emitted
G. procedural status (when applicable)

III. EMISSION SOURCE STATUS

A. source classification code (SCC)
B. compliance status of emission point
C. SIP requirements (applicable)
D. size category of emission point
E. process description
F. predominant pollutant emitted
G. subpart (NSPS and NESHAPS only)
H. procedural status

TABLE 6. (continued)

IV. FIELD INVESTIGATIONS ON EMISSIONS SOURCES

A. field surveillance activity occurred
   1 - date for source compliance if on compliance schedule
B. enforcement action taken (reported monthly)
   1 - date activity occurred and date for source compliance if on compliance schedule
C. pollutants emitted
   1 - classified as
      a. attainment
      b. nonattainment
      c. unclassifiable
   2 - pollutant status
   3 - pollutant size category
D. compliance status indicator codes
   0 - compliance status unknown
   1 - in violation - no schedule
   2 - in compliance - source test
   3 - in compliance - inspection
   4 - in compliance - certification
   5 - in violation - meeting schedule
   6 - in violation - not meeting schedule
   7 - in violation - unknown with schedule
   9 - in compliance - shut down

SECTION 5

CONTROL STRATEGY DIVISION REQUIREMENTS AND ASSISTANCE

PURPOSE OF THE CONTROL STRATEGY DIVISION

Section 3.02 of TCAA requires the TACB to prepare and develop a general, comprehensive plan for the proper control of the air resources of the state. The TACB is authorized by Section 3.09 of TCAA to make rules and regulations to develop and carry out that plan, consistent with the general intent and purposes of TCAA. To aid in developing regulations and to carry out other duties, the TACB is authorized by Section 3.03 of TCAA to require the submission of information by persons whose activities cause emissions of air contaminants to enable the TACB to develop an emissions inventory. In addition the TACB is required by CAA 77 to submit an approvable State Implementation Plan (SIP) to EPA which will allow the state to achieve and maintain NAAQS established by EPA. Other CAA 77 requirements for the TACB include reporting of "reasonable further progress", and developing regulations to comply with Control Techniques Guidelines (CTG) developed by the EPA.

The Control Strategy Division of the TACB has the responsibility to carry out the activities indicated above. Specific duties of this division are:

- To perform engineering studies to evaluate technical feasibility and economic reasonableness of controls for existing pollutant emissions sources.
- To conduct public hearings with industrial and environmental groups and with the general public to allow public participation in the development of new and revised regulations.

- To develop and implement plans for the control of designated pollutants in accordance with Section 109 of CAA 77.
- To conduct special studies preliminary to the development of control strategies.
- To coordinate plans and policies with local governments and regional planning agencies, and to provide technical assistance on transportation planning.
- To conduct special studies concerning provisions of CAA 77 that deal with vehicle inspection and maintenance programs, and other issues.

This division also makes emissions projections at certain times to determine the effect of current or proposed regulations on future emissions.

EMISSIONS INVENTORY DATA REQUIREMENTS

Access to current emissions data via a comprehensive emissions inventory would be most useful for this division. The emissions inventory could be used to project emissions reductions as a result of a new or proposed regulation or control strategy and to determine if a proposed regulation would accomplish desired objectives.

Section 1.02 of TCAA states a purpose to safeguard the air resources of the state, consistent with the protection of the health, general welfare, and physical property of the people. When research or other means indicate that an air contaminant constitutes a health hazard to the people, then the TACB must develop regulations for that contaminant, as outlined above.

The Control Strategy Division is dependent on the maintenance of a comprehensive emission inventory to carry out its duties. Ideally, sufficient data should be in the inventory to allow modeling of any air contaminant in any locality of the state.

Control System Efficiencies And Allowable Emissions

CAA 77 provides that a SIP which demonstrates attainment and maintenance of NAAQS in each AQCR must be developed by each state. The development of an air pollution control strategy designed to attain and maintain the NAAQS requires an analysis of current and possible future air quality problems.

In developing control strategies, the following minimum steps must be followed:

- Review available air quality data to determine whether or not national standards are and will continue to be maintained.
- Identify sources and determine emissions from each source.
- Determine the degree of control that will occur as a result of full compliance with adopted regulations.
- If additional control measures are needed to provide for attainment and/or maintentance of NAAQS, determine the effectiveness of various emission control measures in reducing the ambient air quality.

When the air quality modeling results indicate that control measures above and beyond existing regulations are needed to attain and maintain NAAQS, then the division must perform additional analyses to examine the effectiveness of various types of control measures.

Emissions Projections

TCAA requires that the TACB develop a comprehensive plan for control of the state air resources (Section 3.02), obtain information from persons whose activities cause emissions (Section 3.03), and conduct research that is necessary for the discharge of its duties (Section 3.04). Each of these activities will at some point require the projection of future emissions.

CAA 77, Section 110, requires that all SIPs include emission limitations, schedules, and timetables for compliance with such measures as may be necessary to insure attainment and maintenance

of the primary or secondary NAAQS. The development and reliability of the limitations, schedules, and timetables designed to attain NAAQS will require accurate forecasts of future emission levels. These forecasts will result from the projection of emission levels using various growth indicators (population, employment, etc).

In order to project future emissions TACB must establish current emission levels for point sources and area sources.

The list of actual data elements necessary to determine current emission levels was presented in Section 2.

Emissions Inventory Verification

Legal requirements for emissions inventory verification are not specified either in CAA 77 or TCAA. An emissions inventory is a culmination of information from numerous data sources. Data for the point source portion of an inventory can be obtained through several means, including stack tests, material balance calculations, or standard process reference manuals. The area source data portion of an inventory is also determined from diverse information sources (local, state, regional, and federal agencies).

Even though there are no specific legislative requirements for data verification, emission inventory data bases will benefit from a few basic procedures.

Point source inventories are well defined entities and are really the only emission inventories that can actually be "verified". Information found in a point source inventory comes from one of two sources: state or local permit files, or industry representatives.

A responsive point source verification program should periodically compare inventory data with air pollution control agency permit files. To avoid excessive work this type of data verification should be performed on a spot-check basis. Where errors are found, the inventory can be corrected using the permit information. The inventory or the permit files can, in the same

way, be verified and corrected through periodic contacts with industry representatives. The point source verification procedure should focus on the following "problem" areas:

1. Facility identification data - name, address, and numerical identification should be checked for accuracy. AEROS data codes should be verified to assure proper facility identification.

2. Point source identification data - point source identification codes, and SIC codes should be checked. The Universal Transverse Mercator (UTM) coordinates of each point source should be individually reviewed and verified from U.S. Geological Survey maps of the facility location.

3. Point source operations and emissions - emissions and operating characteristics of the point sources should be verified through periodic review of permit files. Source emissions and operating parameters can be compared for "reasonableness" against "typical" values. The National Technical Information Service provides typical exhaust gas parameters for industrial operations. Standard emission factors are available from the U.S. Environmental Protection Agency.

4. Detection of source duplication - a major source of point source inventory error is the duplication of source information during periodic updates. Duplication can be kept to a minimum through manual audits or computer data checks of the inventory.

Area source inventories are a highly subjective assessment and do not lend themselves to a verification procedure. The methods used to estimate activity levels and determine emission factors in an area source inventory are less well defined than those used in a point source inventory. A prudent means of assuring good information is to perform a comprehensive review of the assumptions and calculations used in the inventory. The problems most often associated with an area source inventory are not concerned with methodology (which is subjective in nature) but with errors in the mathematical calculations.

CTG Implementation

Control Techniques Guidelines (CTG) concerning reasonably available control technology (RACT) are being prepared for those industries that emit significant quantities of air pollutants in areas of the country where NAAQS are not being attained. CAA 77 requires each state in which there is a nonattainment area to adopt and submit a revised SIP which meets the requirements of Section 110 and Subpart D of the Act.

EPA's intent in publishing the CTG documents is to provide the state and local regulatory agencies with information on RACT for source categories. EPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available, considering technological and economic feasibility.

The Control Strategy Division is responsible for the development of strategies that will attain and maintain state ambient air quality standards. In order to do this, the division has to know:

- What are the current levels of emissions for specific processes?
- What projected levels of emissions would occcur if RACT were employed, per CTG's?
- What is the impact of the reduction in emissions on the ambient air quality?

In its planning activities the division must determine total emissions from all sources and relate that total to the projected emissions if sources were subject to RACT guidelines. Without an emissions inventory, that determination cannot be made. Our conclusion then is that the division must have a suitable emissions inventory to be able to determine whether the application of RACT will result in attainment of NAAQS. Although RACT specifications would not be incorporated in the emissions inventory data base, it appears that a RACT flag in the data base for each

source would help the division to scan the inventory to determine which sources could potentially be retrofit with RACT.

Reasonable Further Progress

Section 172 of CAA 77 requires as a precondition for the construction or modification of any major stationary sources in any nonattainment area after July 1, 1979, that SIPs shall provide for attainment of each NAAQS as expeditiously as practicable and, among other things shall show reasonable further progress (RFP) in the interim. RFP is defined in Section 171 of CAA 77 as annual incremental reductions in emissions of the applicable air pollutant which are sufficient to provide for attainment of the applicable NAAQS by the date required. The states are required to report this progress to EPA annually.

Walter C. Barber, Director of OAQPS, wrote to all EPA Regional Administrators describing a relatively simple approach to RFP tracking. According to this memo the first step in the RFP process is to determine the yearly emission reduction milestones to be achieved. Many of these will be clearly stated in the SIP submittal; however, where this is not the case, a simple straight line from the base line SIP emission inventory (total actual emissions) to the 1982 attainment emissions will be sufficient in most cases. The second phase, actual tracking, can be accomplished by maintaining a ledger of decreases and increases in total actual emissions. When a source is certified as in compliance with the applicable regulations the difference between controlled and precontrolled emissions is entered on the decrease side. When a new source begins operation, the increase in emissions is entered on the increase side. At the conclusion of the reporting period, the difference between the increases and decreases is combined with the last year's total inventory (presumably an overall decrease) providing the total emission level for the particular pollutant.

Data elements necessary for tracking RFP:

- All data points necessary to determine the total actual emissions in the nonattainment area.

- All emission reductions accomplished by enforcement proceedings, and voluntary reductions in emissions by source shutdowns and installing new control equipment.
- Emissions increases when new sources begin operation.

The Control Strategy Division has the responsibility to prepare TACB's first RFP report by June 1980.

Oxidant Data Base Requirements

CAA 77 requires that any state which needs an extension of the 1982 attainment date for the ozone NAAQS must submit a revised SIP by July 1, 1982. In order to meet that deadline, EPA has indicated that data collection will have to be completed in 1980. TACB has identified the Houston area as not being able to meet the ozone standard. Thus, such a SIP revision is required. EPA has indicated that a grid-type photochemical airshed model for prediction of ambient ozone concentrations will have to be developed and validated before it can be used in conjunction with developed control strategies for the prediction of future attainment of the ozone NAAQS.

Extensive oxidant data base requirements to model ambient oxidant levels in the Houston area have been identifed in the Federal Register, Volume 44, p. 65667, November 4, 1979.

One of several available photochemical dispersion models will have to be applied to the area of major emissions and the downwind area of maximum ozone concentrations. In order to validate the model and to specify the critical meteorological scenario(s) associated with the design level ozone concentration it is necessary to conduct a rather extensive field study during an ozone season. The extent and density of the environmental data collection network in this field study depends on the expected spatial/temporal variability of the data within the area and on the sensitivity of the model to the data. It is also necessary to assemble or derive spatially/temporally resolved emissions inventories of VOC classes and NO/NO_2 for (1) the base year (corresponding to the field study); (2) for one to two

projection years (effect of regulations "on the books" plus growth); and (3) for the various control strategy scenarios to be tested. Expertise in air pollution meteorology, photochemical modeling, air pollution monitoring, and emissions inventories are generally required to design the data collection effort and to conduct the modeling analysis.

Emissions Data Requirements

- Spatial Resolution. These models require the use of a gridded VOC, NO_x, and CO emissions inventory. Grid squares are typically one kilometer to five kilometers on a side. County-wide area sources are all located to the grid squares using various activity indicators. Roadway emissions are calculated by link and assigned to the appropriate grid and an area source, whereas major point sources, with stack parameters, are located exactly. Emissions inventory guidance is available in EPA 450/4-79-18.

- Temporal Resolution. All emissions must be temporally resolved on an hourly basis for a typical ozone simulation day. Roadway emissions are temporally resolved from traffic data. Information on the diurnal variability of point source emissions is obtained directly from the sources. For area sources, local information on the source categories is used to derive the diurnal emission behavior.

- Pollutant Splits. VOC emissions must be split into three to six hydrocarbon classes (specific to the model used); NO_x emissions are split into NO/NO_2. Information on pollutant splits is available in EPA 450/3-78-119.

Other Data Requirements

Some models require the specification of other variables which may require ambient/meteorological/emissions data. The modeler should consult the user/planning manuals for the specific photochemical dispersion model to determine the required input parameters.

Houston Oxidant Modeling Study

A photochemical, airshed oxidant model was developed for St. Louis at a total cost of about $1.5 million over a period of five years. EPA has proposed the use of that model for Houston

if the model can be validated for Houston. TACB indicates that the St. Louis model may not be appropriate because research indicates that ozone in Houston is not totally attributable to sources in the Houston area. Nevertheless, EPA claims that the proposed validation study which would be conducted by Dr. Basil Dimitriades of EPA would attempt to determine:

- the percentage of ambient ozone that is attributable to Houston sources.
- whether hydrocarbons or NO_x or both should be controlled.
- how much additional control is required to meet NAAQS.

Specialized, detailed emissions data of documented quality are required for the model validation effort. September and October 1978 smog season emissions data are required in conjunction with ambient air quality data for the same period. The ambient data have been collected, but the emissions data have not. TACB and the sources are concerned with the extensive burden of assembling and verifying these two months of emissions data. EPA has indicated that the baseline oxidant inventory will have to be for 1979, but that it will be permissible to adjust the 1979 data to determine the September-October 1978 emissions. Thus the sources will not have to prepare two emissions inventories. It will not be necessary to query small sources for data, but a lower cutoff point has not been established.

At this writing TACB could not agree to the EPA time constraints or conditions for providing verified emissions data for the study. As a consequence, EPA has committed the funds to another aspect of the Gulf Coast study prescribed under Section 403(d) of CAA 77.

SECTION 6

PRIORITIZATIONS FOR COLLECTION OF DATA

OVERVIEW OF CONSTRAINTS ON DATA COLLECTION

The emissions inventory data collection system should ideally be comprehensive, highly sensitive, accurate, and efficient. It should store pertinent emissions data from all point, area, and mobile sources in Texas with a high level of sensitivity. The system should routinely register periodic changes in emissions from existing sources and new sources and should facilitate accurate reporting of emissions. In response to TACB's desire to minimize reporting requirements placed on industry and the private sector, the system should minimize direct solicitation of emissions data from sources. If possible, data should be collected through TACB's existing standard operating procedures. Such conditions would ensure that TACB operates a complete, current emissions inventory system without imposing significant additional reporting requirements on emission sources.

These characteristics are objectives for an ideal emissions inventory system. TACB, however, operates under a variety of internal and environmental constraints which limit the design of an emissions inventory data collection system. Political considerations, resource limitations, and legal requirements obviously affect the design while one of the greatest factors influencing TACB operations is a mandate from the Governor's Office requiring a five percent reduction in work force by August 1980. Currently TACB's workload increases as the number of applications for new permits increase, and the deadline for the 1982 SIP approaches. In addition, EPA occasionally requests support for other high

priority projects. These limitations may reduce the amount of data that TACB can efficiently manage.

TACB's ability to collect and store a comprehensive emissions inventory is significantly affected by political decisions outside the control of the staff. EPA guidelines and TACB permitting, monitoring, and regulatory activities directly affect the potential for industrial growth in Texas. The nature of the relationships between EPA, TACB, and private industry includes a series of complex negotiation systems which generally result in compromises by the bargaining parties -- compromises which may constrain the latitude of staff activities.

Finally, State, Federal and TACB guidelines significantly influence TACB activities and emphasis. The effect of legislation and agency regulation are exemplified by requirements for the SIP specified in 40 CFR Part 51.12. Using there guidelines, TACB defines regions where ambient levels of pollutants exceed the levels specified by an applicable national standard and presents control strategies for each of these pollutants.

Due to these constraints the primary focus of this project is on the minimum emissions data set required to satisfy TACB operational activites. TACB data collection systems must reflect TACB's intra-agency priorities for emissions data. The priorities for data collection activities could be based on a variety of classification schemes. For example, it is possible to prioritize data collection activities by source characteristics, EPA program requirements, or TACB organization design. Prioritization based on source characteristics would consider factors such as source size, type of emissions, and tons per year of actual, allowable, and potential emissions. A data collection system based on EPA program requirements would rank emissions sources in terms of their contribution to future SIP revisions and PSD and RFP requirements. A plan for collecting data could also be tied to some prioritized ranking of divisions within TACB. Under this scheme the policy would assign priorities to its activities (issuing new permits vs. monitoring permitted

sources vs. developing regulations related to control strategies) which would affect data collection system design and implementation priorities.

The task plan specifies that priorities for data collection are to be based on certain timing considerations and geographical characteristics. The following section of the Phase I report describes a methodology for prioritizing emissions data collection efforts.

Geographical Priorities For Data Collection

Our methodology for prioritizing emissions data collection activities is based on three geographical factors specified in the task plan: attainment status by county, population growth, population density and projected permitting activity. These geographical considerations are tied to existing requirements to report reasonable further progress (RFP) in nonattainment areas, develop control strategies as a part of the 1982 SIP, and develop a photochemical oxidant dispersion model. In addition to these requirements, EPA will designate responsibility to TACB for implementing the PSD program in Texas.

Attainment status for an area is defined in terms of the ambient air quality of the locality as compared with NAAQS. The nonattainment designation occurs when existing ambient pollutant levels exceed the NAAQS. EPA currently specifies NAAQS for six pollutants -- ozone, carbon monoxide, nitrogen dioxide, particulates, sulfur dioxide, and lead. Table 7 summarizes the current TACB list of designated nonattainment areas for the five criteria pollutants. Nonattainment designations for lead are source specific required under Section 107(d) of CAA 77.

The revised SIP presents strategies for attaining the national ambient air quality standards for all pollutants except ozone in the Harris County nonattainment area. TACB uses emissions data in air quality modeling to demonstrate attainment or nonattainment via designated control strategies. While the emissions inventory should include data from all counties to

TABLE 7. SUMMARY OF DESIGNATED NONATTAINMENT AREAS FOR PERTINENT CRITERIA POLLUTANTS

AQCR	Ozone	Carbon monoxide	Particulate	Lead
Tyler-Texarkana EPA No. 022	Gregg Co.			
Beaumont-Port Arthur-Orange EPA No. 106	Jefferson Co. Orange Co.			
El Paso EPA No. 153	El Paso Co.	One area in the City of El Paso.	Four areas in the City of El Paso.	One area in El Paso.
Abilene-Wichita Falls EPA No. 210				
Amarillo-Lubbock EPA No. 211				
Austin-Waco EPA No. 212				
Brownsville-Laredo EPA No. 213			One area in the City of San Benito; One area in the City of Brownsville.	
Corpus Christi-Victoria EPA No. 214	Nueces Co. Victoria Co.		Two areas in the City of Corpus Christi.	
Dallas-Fort Worth EPA No. 215	Dallas Co. Tarrant Co.		Three areas in the City of Dallas; One area in the City of Fort Worth	
Houston-Galveston EPA No. 216	Harris Co. Galveston Co. Brazoria Co.		Four areas in Harris County.	
San Antonio EPA No. 217	Bexar Co.			
Midland-Odessa EPA No. 218	Ector Co.			

support air quality modeling activites, demographic factors and nonattainment status suggest a four-level collection schedule shown in Figure 2.

This multi-tiered approach assumes that population growth and population density and the potential for exceeding the primary NAAQS should affect the data collection schedule. As a part of the implementation plan we recommend a data collection timetable that reflects the priorities shown in Figures 2 and 3.

Priority Level I contains counties in Texas which have significant emissions reduction requirements combined with a large population. The population in these four counties is projected to be almost five million, 36 percent of the total projected 1982 Texas population. Houston is the only area that is not projected to meet the primary ozone NAAQS by 1982. Dallas, Tarrant, and El Paso counties must reduce their VOC emissions by 25, 18, and 18 percent, respectively. These counties also contain areas which exceed the NAAQS for total suspended particulates (TSP). El Paso is currently the only county in Texas containing an area which does not meet the national ambient air quality standards for carbon monoxide and lead.

The counties in priority Level II are the remaining major metropolitan areas that exceed the NAAQS for ozone. By 1982 almost 2.5 million people are expected to live in these five counties. As leading growth centers, these areas have the potential for exceeding NAAQS for other criteria pollutants. Two areas in Corpus Christi are currently designated TSP nonattainment areas.

Priority Level III contains the remaining standard metropolitan statistical areas (SMSA) in Texas. With a few exceptions shown on Table 7, these SMSA's do not currently exceed the NAAQS for any criteria pollutant. As these areas grow, the number of mobile, point, and area sources will increase. TACB will be required to establish baseline emissions and to track changes in emission levels in these areas as a part of the PSD program.

FIGURE 2. COLLECTION SCHEDULE FOR NONATTAINMENT STATUS.

I.

NONATTAINMENT
URBAN CENTERS WITH
SIGNIFICANT
EMISSIONS REDUCTION
REQUIREMENTS

II.

OTHER NONATTAINMENT
MAJOR URBAN CENTERS

III.

ATTAINMENT URBAN AREAS
A FEW VERY SMALL NONATTAINMENT AREAS
AREAS WITH HIGH PSD PERMITTING
ACTIVITY OR HIGH EMISSIONS DENSITY.

IV.

ALL OTHER COUNTIES

FIGURE 3. PRIORITY TIMETABLE FOR TEXAS' STATE IMPLEMENTATION PLAN.

PRIORITY LEVEL I
COUNTIES

HARRIS
DALLAS
EL PASO
TARRANT

PRIORITY LEVEL II
COUNTIES

BRAZORIA
GALVESTON
NUECES
TRAVIS

PRIORITY LEVEL III
COUNTIES

BOWIE	LUBBOCK
BRAZOS	McLENNAN
CAMERON	MIDLAND
COLLIN	ORANGE
DENTON	POTTER
ECTOR	SMITH
FORT BEND	TAYLOR
GRAYSON	TOM GREEN
GREGG	WEBB
HIDALGO	WICHITA
JEFFERSON	VICTORIA

PRIORITY LEVEL IV

ALL OTHER COUNTIES

Also included in priority Level III are attainment and unclassified areas which have shown high permitting activity or have a high emissions density. PSD regulations necessitate comprehensive inventory for these areas.

The population of nonmetropolitan areas in Texas was 25 percent of the total state population in 1978. These rural areas comprise Priority Level IV. Although a significant percentage of the people in Texas live outside SMSA's, these low population density counties are generally characterized by lower industrialization and many fewer mobile and other area sources than found in SMSA's. Assuming that these counties have the least potential for exceeding the NAAQS, they are ranked the lowest in our data collection scheme.

Table 8 is a matrix which identifies projected population growth, population density, and attainment status for the counties in Data Collection Priority Levels I and II.

TABLE 8. PROJECTED POPULATION AND ATTAINMENT STATUS FOR PRIORITY LEVELS I AND II

County	Population data[a]				Attainment status					Source Data		
	1980 population and (population density)	1985 population and (population density)	1990 population and (population density)	Percent change in population 1980-1990	Ozone and (percent emissions reductions required)	CO	TSP	SO_2	Pb	Estimated point source growth rate, %	Estimated 1982 VOC emissions from point sources	Estimated 1982 VOC emissions from mobile sources
Dallas	1,507,700 (1,755)	1,609,500 (1,873)	1,713,400 (1,995)	13.6	b (27)		b (3 areas)		d	0.1	31,423	51,012
El Paso	467,100 (442)	512,200 (485)	562,300 (532)	20.4	b (29)	b	b (4 areas)		b	0.0	9,924	12,278
Harris	2,243,400 (1,032)	2,489,200 (1,445)	2,763,500 (1,604)	23.1	c (60)		b (4 areas)	d	d	1.4	135,274	67,856
Tarrant	787,600 (915)	825,000 (958)	862,400 (1,001)	10.9	b (20)		b (1 area)			0.4	22,985	28,844
Bexar	982,600 (789)	1,062,800 (853)	1,143,300 (918)	16.3	b (12)					0.4	14,619	29,985
Brazoria	140,300 (99)	157,800 (111)	176,900 (124)	26.1	b						32,847	4,398
Galveston	197,200 (494)	211,200 (529)	226,000 (566)	14.6	b				d	0.1	31,423	51,012
Nueces	261,300 (310)	274,700 (326)	288,400 (343)	10.3	b		b (2 areas)		d	1.1	30,753	12,073
Travis	422,100 417	482,900 477	545,000 538	29.1	b							

[a]Population projections: Texas Department of Water Resources Austin, 1979. LP-105. Population densities in people per square mile.

[b]Currently has areas with nonattainment status: Projected to be in attainment of primary NAAQS by 12/31/82.

[c]Currently has areas in nonattainment status: Projected not to be in attainment of primary NAAQS by 12/31/82. Extension to 12/31/87 requested.

[d]Potentially has nonattainment areas.

SECTION 7

CONCLUSION - DATA DISSEMINATION REQUIREMENTS

USER EMISSIONS INVENTORY DATA REQUIREMENTS

Preceding sections of this report indicate that the Emissions Inventory Section generally responds to ad hoc requests for emissions inventory tabulations from other divisions and does not submit routine standardized reports. The Control Strategy Division is by far the most frequent requestor of emissions inventory data.

Our review of emission inventory reporting requirements confirmed that the annual submission of updated NEDS files is the only routine periodic standardized report presently disseminated by the Emissions Inventory Section.

In addition to NEDS, a standardized reporting format entitled, "Source Inventory: Accounting Information Summary" has been developed by the Emissions Inventory Section staff as a primary output requirement for the emissions inventory system once it is automated and operational. The implications of this finding for the ultimate design and operation of an automated emissions inventory system are significant. Numerous non-routine requirements for special sorts, cross tabulations, and indexing arrangements in the emissions inventory system put a premium on flexibility, ease of access, and manageability of the data files.

User requirements for existing emissions inventory data can be generalized as requests for tabulation or indexing of emission, process, and/or control data according to some specified level of emissions, geographical area, etc. At one extreme, a request may be made for the Emissions Inventory Section to provide "all data" on a given facility or source in order to compare

modified data provided by the source. At the other extreme, the Emissions Inventory Section may be requested to provide a statewide summary of total emissions of a given pollutant in response to legislative requests or SIP requirements.

EMISSIONS INVENTORY REPORTING REQUIREMENTS

In light of the above discussions, rather than presenting proposals for standardized routine report formats, we have instead prepared the following discussion of generalized reporting conventions which could be incorporated into the emissions inventory system design. These conventions should satisfy most of the dissemination requirements of the Emissions Inventory Section.

Minimum recommended capabilities include:

- Dump or list file
- Index/Order file
- Crosstabulate

Each of these capabilities is summarized below.

1. Dump File

   The dump file or list file function would simply report selected input data in storage upon request. A significant percentage of agency requests for emissions inventory information falls into this category. Examples of questions this function should be designed to answer include:

   - What are the types and parameters of control equipment at Plant X?
   - What are the allowable emissions of particulates at Plant X?
   - What is the rated design capacity of process Y at Plant X?
   - What is the SO_2 emission factor for given process Y?
   - What were our gasoline marketing assumptions about county Z?
   - What do we have on file regarding Account number BL-0391-S?

Although the annual NEDS update is described in terms of a standardized routine report, it is conceptually based on the dump input or list input function. It requires nothing more than a simple restatement of a large subset of emissions inventory input data.

2. Index/Order File

The suggested Index/Order file function would, like the dump function, simply provide as output selected input data upon request. The difference in the two functions is that the index/order file function selects, examines, and rank-orders data elements according to assigned criteria prior to being reported as output.

Examples of output this function should be designed to provide include:

- List in order of magnitude the top five SO_2 point-sources in Harris County and list their emissions.
- List in order of lead emission magnitude all lead acid battery manufacturers in the state along with process, control, and emissions data.
- List by region, all sources and associated emissions meeting the following criteria: Sources emitting more than 25 tons lead per year and sources involved in battery manufacture, lead smelting, or copper smelting regardless of emissions.

3. Crosstabulation

The design of the EI should be flexible enough to allow for examination of relationships among two or more variables. The simplest, and often most useful, procedure for a preliminary examination of such relationship is the crosstabulation.

A crosstabulation is defined as a joint frequency distribution of two or more variables. The crosstabulate function reports the joint frequency of occurrence of each unique value detected for two or more variables, along with others descriptive data (percentages of total, measures of association, etc.).

Crosstabulations are best explained by means of examples. Consider the question, "What is the breakdown of source compliance status in each AQCR in Texas?"

The resulting output would appear as shown in Figure 4.

FIGURE 4. OUTPUT FOR POINT SOURCE INVENTORY CROSSTABULATION.

File: Point Source Inventory
Variables: Source Compliance Status
AQCR Numbers

NUMBER OF SOURCES

Compliance code	Category label	AQCR 210	211	212	...	106	Row total
1	In compliance	50	113	648	...	36	1,974
2	Non-compliance/ variance	60	25	180	...	12	560
3	Non-compliance/ non-variance	20	6	75	...	1	331
4	Compliance Unknown	8	15	20	...	5	180
	Column Total	138	159	923	...	54	3,045

Row, column, and total percentage distributions could easily be included in the table for relative value analysis, e.g.:

Compliance code	Category label	AQCR 210	211	...	Row total
1	In compliance	50	113	...	1,974
	- % of Column	36.2	74.8	...	64.8
	- % of Row	2.5	5.7	...	100.0
	- % of Total	1.6	3.7	...	64.5
	Column total	138	159	...	3,045
	- % of Column	100.0	100.0		100.0
	- % of Row	4.5	5.0		100.0
	- % of Total	4.5	5.0		100.0

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